J. HARRISON.

Bell-Ringing.

No. 139,147. Patented May 20, 1873.

Fig: 1.

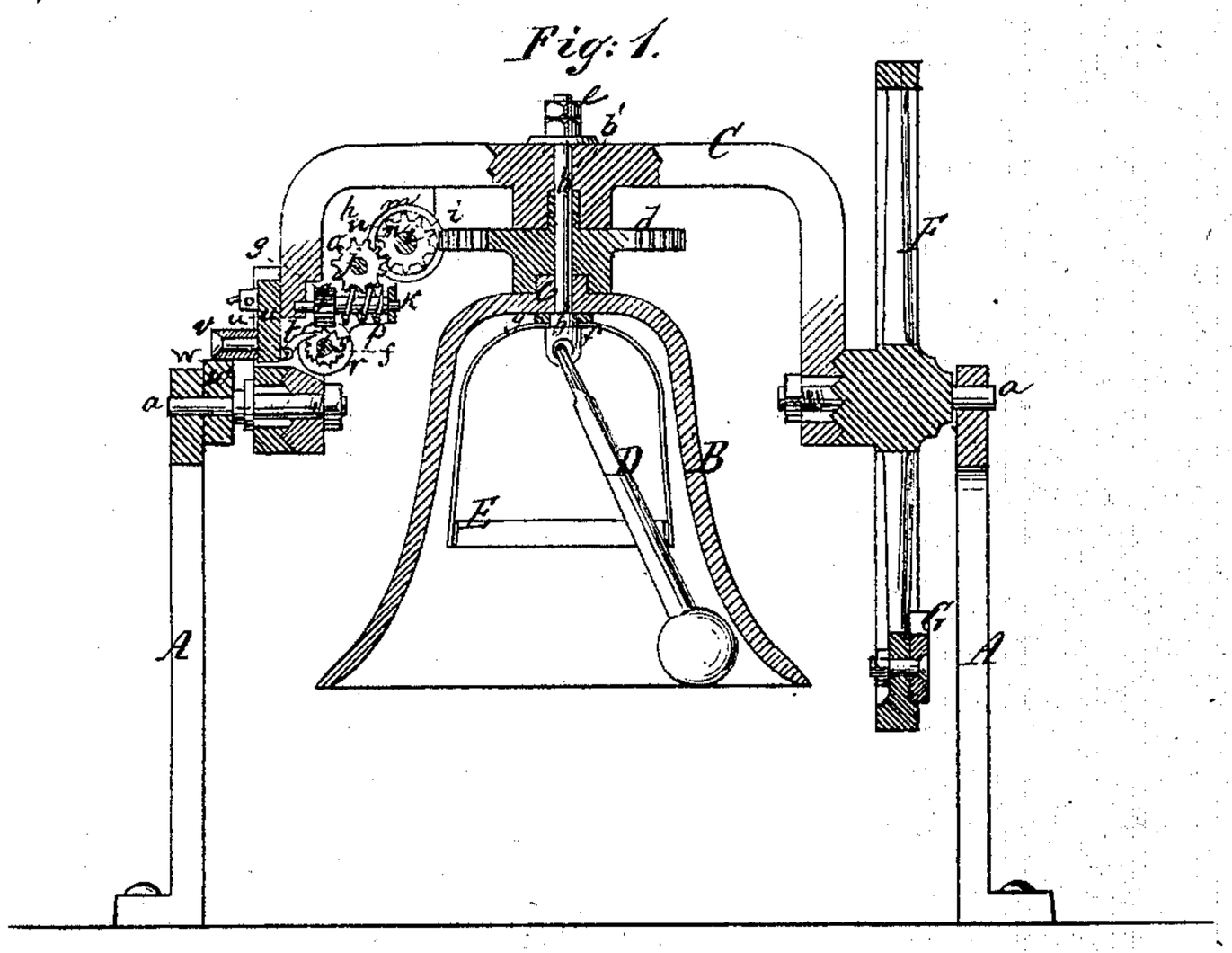
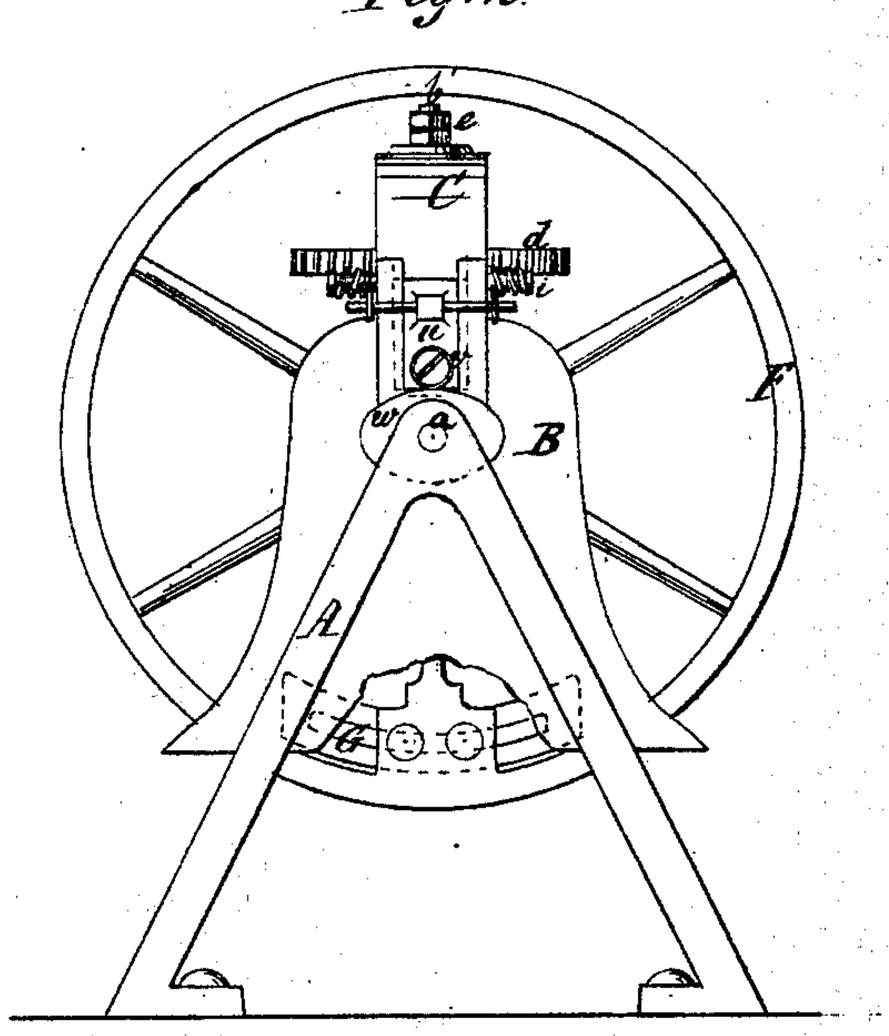


Fig: 2.



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UNITED STATES PATENT OFFICE.

JAMES HARRISON, OF EAST HAMPTON, CONNECTICUT.

IMPROVEMENT IN BELL-RINGING.

Specification forming part of Letters Patent No. **139,147**, dated May 20, 1873; application filed December 4, 1872.

To all whom it may concern:

Be it known that I, JAMES HARRISON, of East Hampton, in the county of Middlesex and State of Connecticut, have invented a new and useful Improvement in Bells; and I do hereby declare the following to be a full, clear, and exact description, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which drawing—

Figure 1 represents a vertical central section of my invention. Fig. 2 is a side view of the same.

Similar letters indicate corresponding parts.

My invention consists in arranging an annular clapper-guard in the interior of a bell in such a manner that in whatever direction the clapper strikes it is caught by the guard and prevented from resting against the bell and from interfering with its vibrations.

In the drawing, the letters A A designate two stands, which form the bearings for the gudgeons *a* of the yoke C which supports the bell B. The connection between the bell and the yoke is effected by an eyebolt or clevis, *b*, from which is suspended the clapper D. On the upper surface of the bell is formed a conical projection, *c*, which catches in a corresponding cavity in the hub of a cog-wheel, *d*, which turns on the clevis-bolt *b'*, and which, when the nut or nuts *e* on the upper end of said elevis-bolt are screwed up, is wedged in over the projection *c* of the bell, so that, if said cog-wheel is revolved, the bell is compelled to revolve with it. On the inner end of the clevis is formed a shoulder, *f*, which supports the annular guard E, and between this guard and the bell is placed a ring or collar, *g*, which bears against the inner surface of the bell, allowing said bell to revolve, while the annular guard remains stationary. If desired, however, the guard and the clapper may be made to revolve with the bell. The object of this guard is to prevent the clapper from resting against the body of the bell, and in order to accomplish this object the guard is made of an elastic strip of sheet metal, so that, when the clapper drops down upon it, it yields sufficiently to allow the same to strike the bell, but as the guard recovers its shape immediately after the bell has been struck, the clapper is prevented from resting against the bell and from interfering with its vibrations. My annular guard allows the clapper to strike the bell in any direction or from any angle with a uniform effect, as will be readily understood if this guard be applied to an ordinary hand-bell. In one side of the yoke C is a recess, *h*, in which are mounted four shafts, *i j k l*, as shown in Fig. 1. On the shaft *i* is secured an endless screw, *m*, which meshes in the cog-wheel *d*, and also a pinion, *n*, which gears in a worm-wheel, *o*, mounted on the second arbor *j*. This worm-wheel meshes in an endless screw, *p*, secured on the arbor *k*, and on this arbor is also mounted a worm-wheel, *q*, which meshes in an endless screw, *r*, mounted on the arbor *l*. On this last-named arbor is also secured a ratchet-wheel, *s*, which engages with a pawl, *t*, that is hinged to a slide, *u*, moving up and down in suitable guide-grooves on the outside of the yoke C. In this slide is secured a roller-stud, *v*, which is held in contact with a stationary cam or eccentric, *w*, by the action of one or more springs acting on the slide *u*. This cam is fastened to one of the standards A, and it is of such a shape that when the bell is at rest the roller-stud *v* will occupy its lowest position, and, consequently, the springs which act on the slide *u* are exposed to the least possible strain. If an oscillating motion is imparted to the bell the cam *w* forces the slide upward, and the pawl *t* pushes the ratchet-wheel *s* forward for one tooth, and whenever the bell passes its central or vertical position the slide falls back to its lowest position, and the pawl takes a fresh tooth of the ratchet-wheel. For every swing of the bell, therefore, the ratchet-wheel *s* is propelled one tooth, and this motion is transmitted by the triplex-screw movement to the bell. On one of the gudgeons of the yoke C is mounted the rope-wheel F, and this wheel is provided with an adjustable or sliding weight, G. The object of this weight is to make the bell hang centrally between the frame, so that the blows of the clock-hammer, which may strike the bell on the outside, will be of uniform force. Bells are not always cast perfectly true and of uniform thickness all around, and when the bell is rotated and its

position changed it will not hang vertically, but sometimes at an angle of ten to twenty or more degrees toward a perpendicular line drawn through its center. In that case the clock-hammer will not strike the bell uniformly, and by moving the weight G I am enabled to remedy this defect at any time.

The triplex-screw movement which I have described in the above specification is the only thing which an experience of fourteen years' standing has proved to work practically for the purpose of imparting to the bell the required automatic revolving motion, since by this movement I obtain all the power required to move the heaviest bell.

The eccentric is oval-shaped, and when the bell is at a state of rest the roller on the sliding pawl *t* is on the lowest part of the oval-shaped eccentric *w*, and the springs of the pawl *t* are at a state of rest, having but very little tension. But with the upright eccentric cam, as heretofore used, when the bell is at a state of rest the roller on the lever or working-pawls is on the top or highest part of the eccentric cam, and the spring that works the lever is kept at the highest strain or tension all the time the bell is at rest, and after remaining in this state for months and years, as the case may be, the material of which the spring is made loses its elasticity and becomes inoperative. This is a natural consequence. The oval-shaped double eccentric or inclines are intended to remove this difficulty, and if the bell swings clear round it produces the same effect while the roller-stud passes over the lower portion of said eccentric as it does while passing over the upper portion.

What I claim as new, and desire to secure by Letters Patent, is—

The combination of an annular clapper-guard with a bell, substantially as and for the purpose described.

JAMES HARRISON.

Witnesses:

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E. F. KASTENHUBER.